Team 4 - Requirements Analysis

1. The digital power supply should not suffer damages at temps down to -40°C
2. Weather system will survive and operate at temperatures at about -70°C (Should maintain the specified output voltage over the temperature range 0-70°C)
3. Power supply system should be less than 25g (including PCB/components)
4. System should have flying leads for the connection to the battery
5. System should have test pins for the output voltages
6. System should generate a maximum short circuit output current of 30mA on either output
7. Should have a power efficiency of over 60% with 20mA current load on either of the two outputs
8. The digital power supply should have a voltage output between 4.85V-5.15V since the highest minimum and lowest maximum voltages for the modules are 4.85V and 5.15V respectively. The output current here should be 12mA since it is the maximum the CPU can handle
9. It should also have a voltage output between 11.2V-12.8V as it is within the range required for the FLASH memory. The output current here should be 20mA as the FLASH memory can handle this
10. The single input voltage should be at least 14.8V using four 3.7V lithium-ion batteries which should be able to power all modules and this is not within +/- 10% of either output voltage making it suitable
11. The system should maintain the output voltage specifications with an input voltage of +/- 20% from the nominal
12. Must use DipTrace for designing the PCB which is free & for non-profit use
13. The PCB board should be doubled sided with a through hole plate so components will only be placed on the top side.
14. Surface mount components will be used (no thru-hole components) of the package type 0805 while surface mount inductors cannot be used
15. Narrow range of regulators and DC-DC converters to choose from within the lab
16. Board should have dimensions of 5cm x 5cm (a square)
17. The vias (vertical interconnect access) holes should be 0.8mm while the copper pads should be 1.6mm
18. The holes for attachment of the wires/test pins should be 1.00mm while the copper pads should be 1.8mm
19. The track width should be a minimum of 0.4mm
20. The track to track/track to pad separation should be a minimum of 0.4mm
21. The Copper pour spacing should be 1mm
22. The track/via/pad to board edge separation should have no tracks within 2mm of the edge
23. Group number to be written in copper on the board on the top-side along the top